N- AND P-CHANNEL ENHANCEMENT MODE POWER MOSFET

MTC3585G6

Description

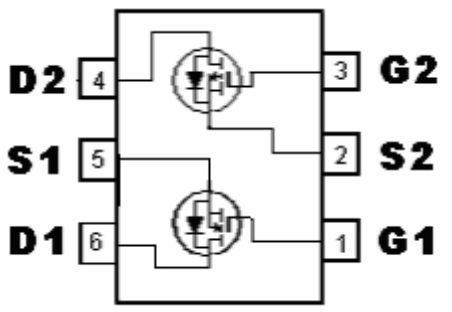
The MTC3585G6 consists of a N-channel and a P-channel enhancement-mode MOSFET in a single TSOP-6 package, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.
The TSOP-6 package is universally preferred for all commercial-industrial surface mount applications.

Features

- Simple drive requirement
- Low gate charge
- Low on-resistance
- Fast switching speed
- Pb-free package

Equivalent Circuit

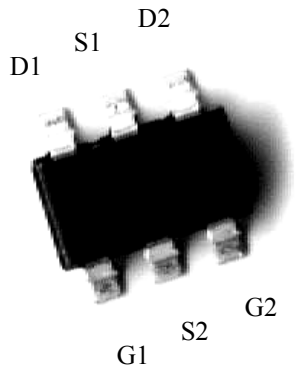
MTC3585G6



G：Gate
S：Source
D：Drain

Outline

TSOP-6



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits		Unit
		N-channel	P-channel	
Drain-Source Breakdown Voltage	BV_{DSS}	20	-20	V
Gate-Source Voltage	V_{GS}	±12	±12	V
Continuous Drain Current @T_A=25 °C (Note 1)	I_D	3.5	-2.5	A
Continuous Drain Current @T_A=70 °C (Note 1)	I_D	2.8	-1.97	A
Pulsed Drain Current (Note 2)	I_{DM}	10	-10	A
Total Power Dissipation (Note 1)	Pd	1.14		W
Linear Derating Factor		0.01		W / °C
Operating Junction and Storage Temperature	Tj, Tstg	-55~+150		°C
Thermal Resistance, Junction-to-Ambient (Note 1)	Rth,ja	110		°C/W

Note : 1.Surface mounted on 1 in² copper pad of FR-4 board, t≤5 sec; 180°C/W when mounted on minimum copper pad
2.Pulse width limited by maximum junction temperature

N-Channel Electrical Characteristics (Tj=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	20	-	-	V	V_{GS}=0, I_D=250μA
$\Delta BV_{DSS}/\Delta Tj$	-	0.02	-	V/°C	Reference to 25°C, I_D=1mA
$V_{GS(th)}$	0.5	-	1.2	V	V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±12V, V_{DS}=0
I_{DSS}	-	-	1	μA	V_{DS}=20V, V_{GS}=0
I_{DSS}	-	-	10	μA	V_{DS}=16V, V_{GS}=0, Tj=70°C
*$R_{DS(ON)}$	-	-	75	mΩ	I_D=3.5A, V_{GS}=4.5V
	-	-	125		I_D=1.2A, V_{GS}=2.5V
*G_{FS}	-	7	-	S	V_{DS}=5V, I_D=3A
Dynamic					
Ciss	-	230	370	pF	V_{DS}=20V, V_{GS}=0, f=1MHz
Coss	-	55	-		
Crss	-	40	-		
*$t_{d(ON)}$	-	6	-	ns	V_{DS}=15V, I_D=1A, V_{GS}=5V, R_G=3.3Ω, R_D=15Ω
*t_r	-	8	-		
*$t_{d(OFF)}$	-	10	-		
*t_f	-	3	-		
*Qg	-	4	7	nC	V_{DS}=16V, I_D=3A, V_{GS}=4.5V
*Qgs	-	0.7	-		
*Qgd	-	2	-		
Rg	-	1.1	1.7	Ω	f=1MHz
Source-Drain Diode					
*V_{SD}	-	-	1.2	V	V_{GS}=0V, I_S=1.2A
*trr	-	16	-	ns	I_S=3A, V_{GS}=0V, dI/dt=100A/μs
*Qrr	-	8	-	nC	

*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

P-Channel Electrical Characteristics (Tj=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-20	-	-	V	V_{GS}=0, I_D=-250μA
$\Delta BV_{DSS}/\Delta Tj$	-	-0.01	-	V/°C	Reference to 25°C, I_D=-1mA
$V_{GS(th)}$	-	-	-1.2	V	V_{DS}=V_{GS}, I_D=-250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±12V, V_{DS}=0
I_{DSS}	-	-	-1	μA	V_{DS}=-20V, V_{GS}=0
I_{DSS}	-	-	-25	μA	V_{DS}=-16V, V_{GS}=0, Tj=70°C
*$R_{DS(ON)}$	-	-	120	mΩ	I_D=-2.8A, V_{GS}=-10V
	-	-	160		I_D=-2.5A, V_{GS}=-4.5V
	-	-	300		I_D=-2A, V_{GS}=-2.5V
*G_{FS}	-	4	-	S	V_{DS}=-5V, I_D=-2A
Dynamic					
Ciss	-	270	430	pF	V_{DS}=-20V, V_{GS}=0, f=1MHz
Coss	-	70	-		
Crss	-	55	-		
*$t_{d(ON)}$	-	6	-	ns	V_{DS}=-10V, I_D=-1A, V_{GS}=-10V, R_G=3.3Ω, R_D=10Ω
*t_r	-	17	-		
*$t_{d(OFF)}$	-	16	-		
*t_f	-	5	-		
*Qg	-	5	8	nC	V_{DS}=-16V, I_D=-2A, V_{GS}=-4.5V
*Qgs	-	1	-		
*Qgd	-	2	-		
Source-Drain Diode					
*V_{SD}	-	-	-1.2	V	V_{GS}=0V, I_S=-1.2A
*trr	-	20	-	ns	I_S=-2A, V_{GS}=0V, dI/dt=100A/μs
*Qrr	-	15	-	nC	

*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

N-channel Characteristic Curves

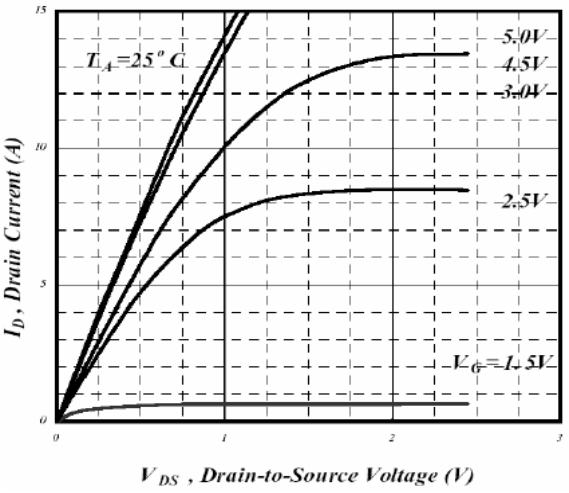


Fig 1. Typical Output Characteristics

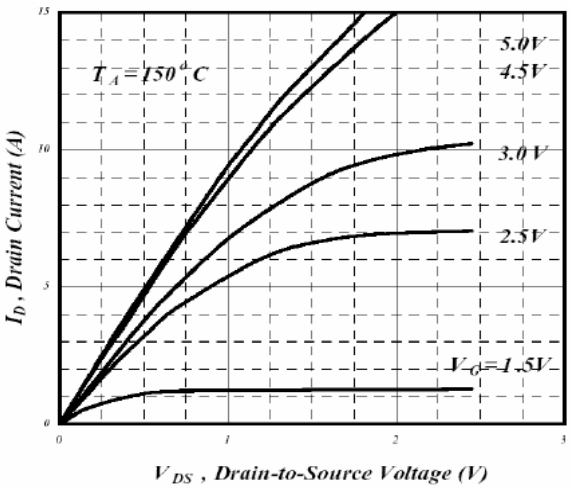


Fig 2. Typical Output Characteristics

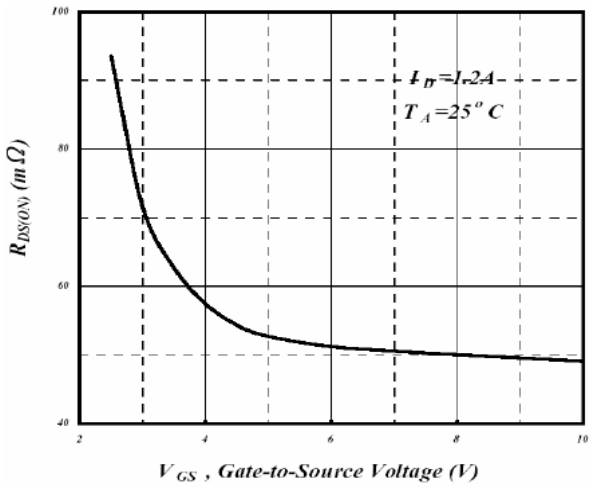


Fig 3. On-Resistance v.s. Gate Voltage

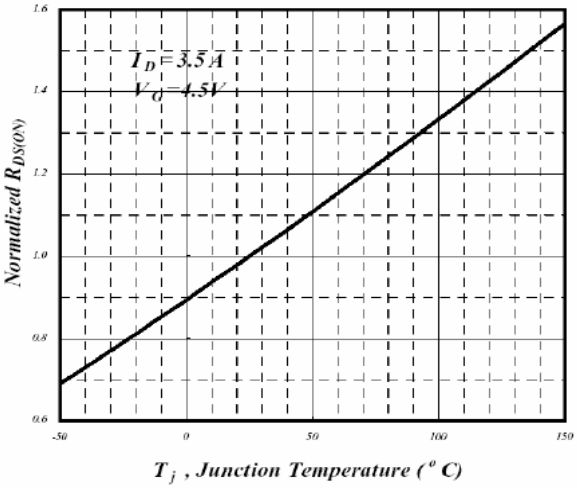


Fig 4. Normalized On-Resistance v.s. Junction Temperature

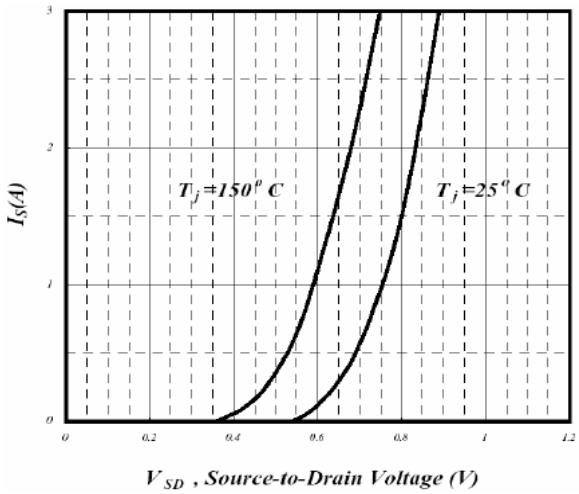


Fig 5. Forward Characteristics of Reverse Diode

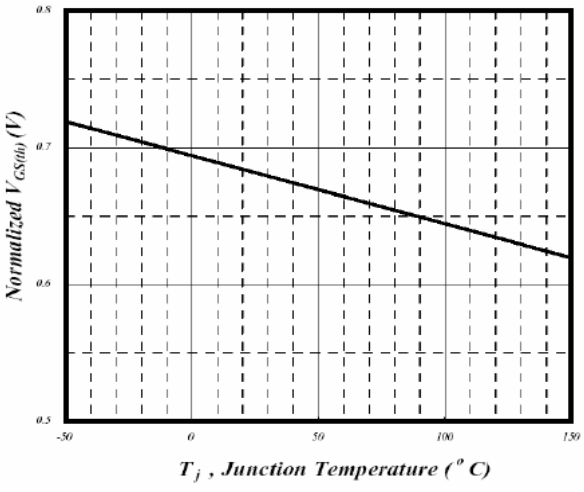


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

N-channel Characteristic Curves(Cont.)

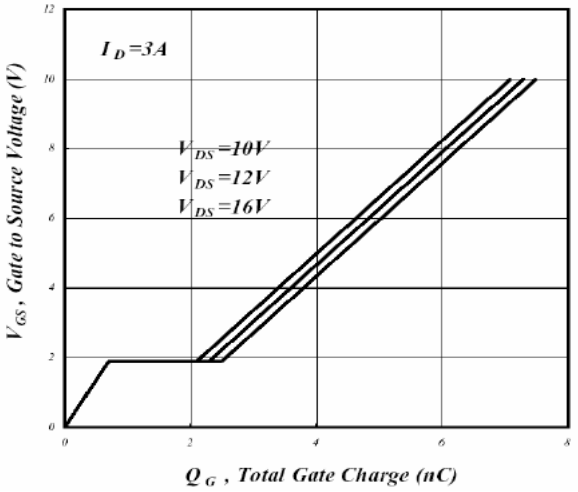


Fig 7. Gate Charge Characteristics

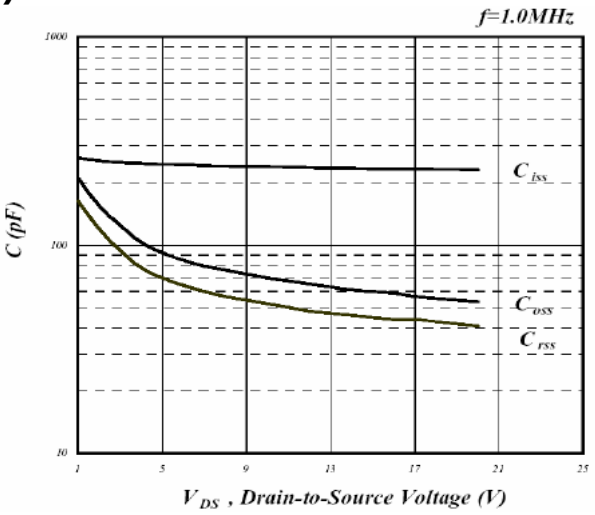


Fig 8. Typical Capacitance Characteristics

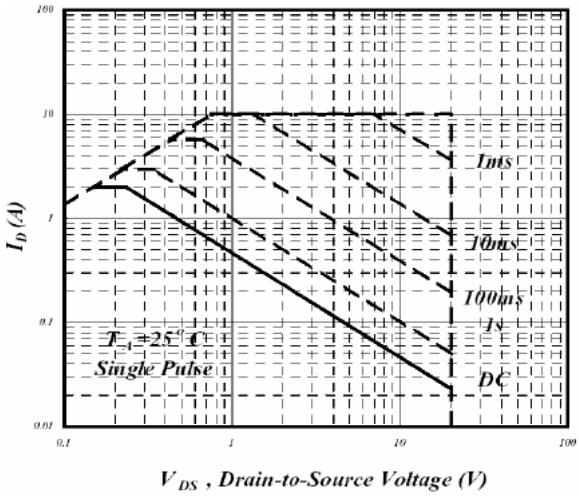


Fig 9. Maximum Safe Operating Area

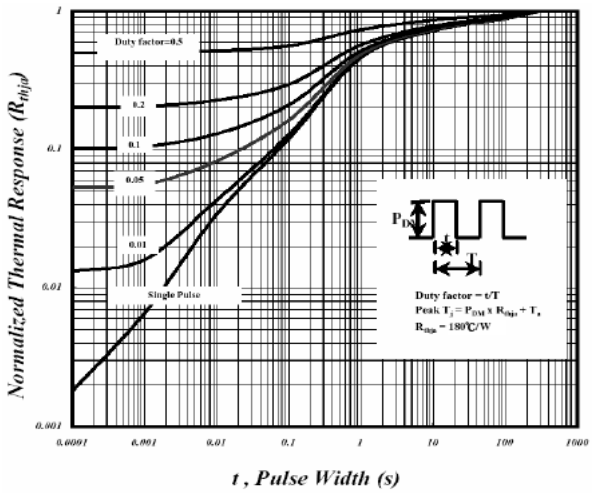


Fig 10. Effective Transient Thermal Impedanc

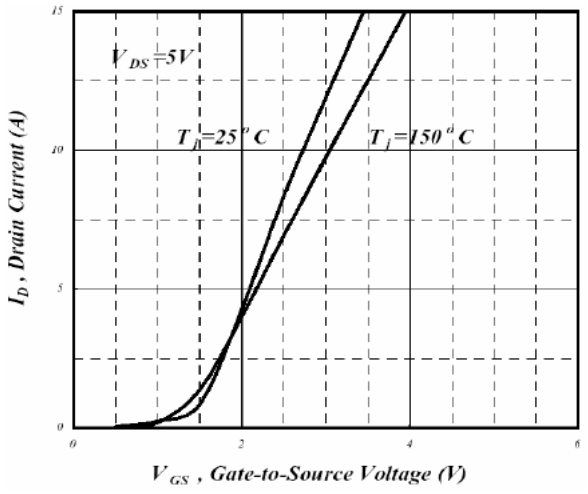


Fig 11. Transfer Characteristics

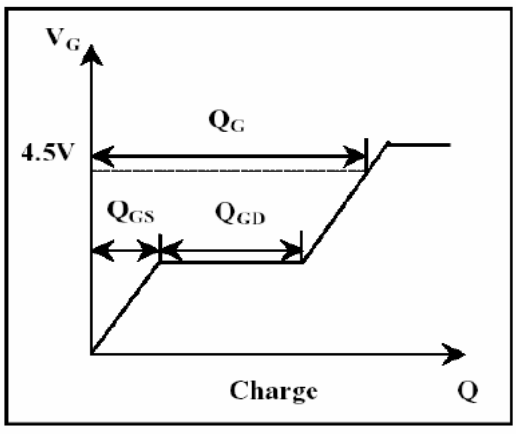


Fig 12. Gate Charge Waveform

P-channel Characteristic Curves

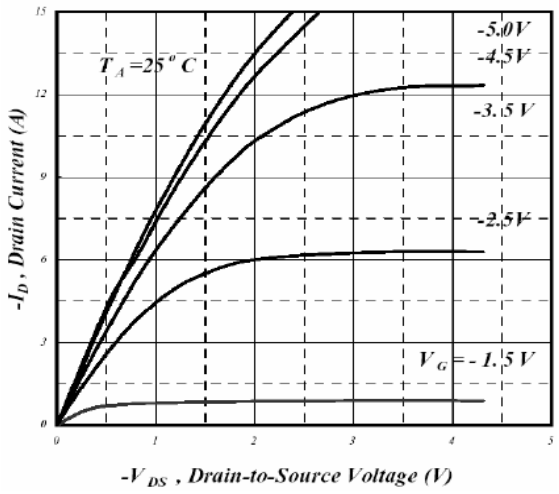


Fig 1. Typical Output Characteristics

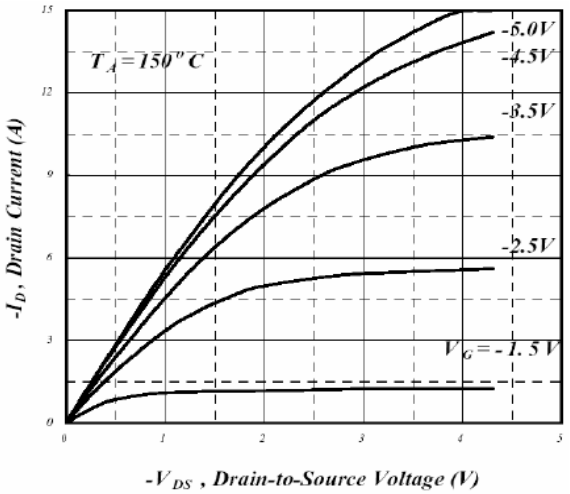


Fig 2. Typical Output Characteristics

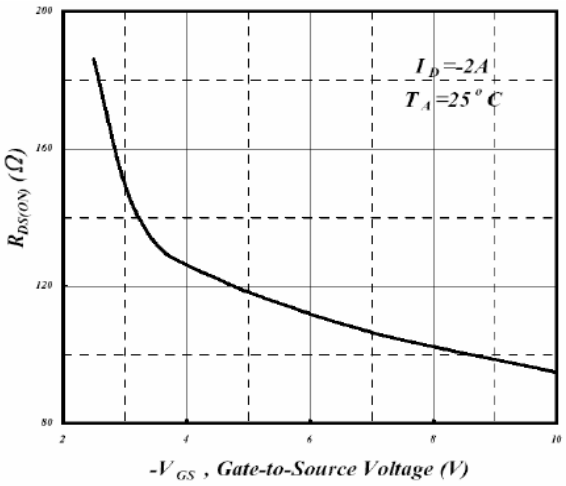


Fig 3. On-Resistance v.s. Gate Voltage

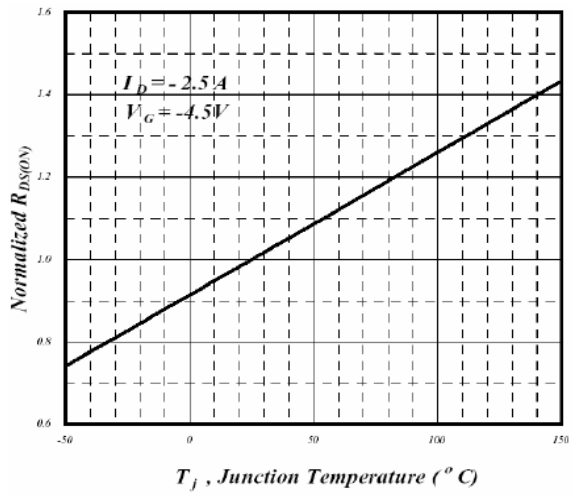


Fig 4. Normalized On-Resistance v.s. Junction Temperature

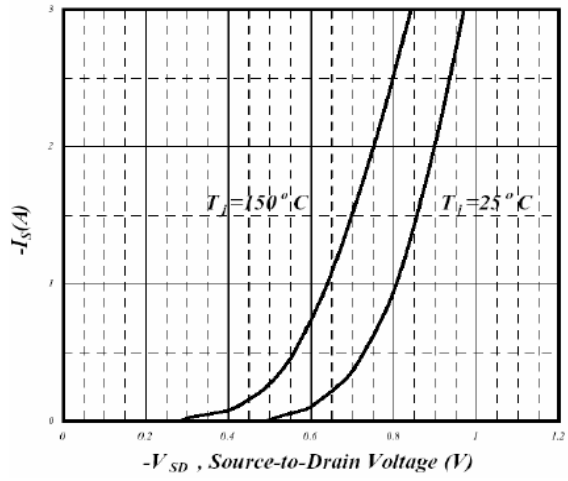


Fig 5. Forward Characteristics of Reverse Diode

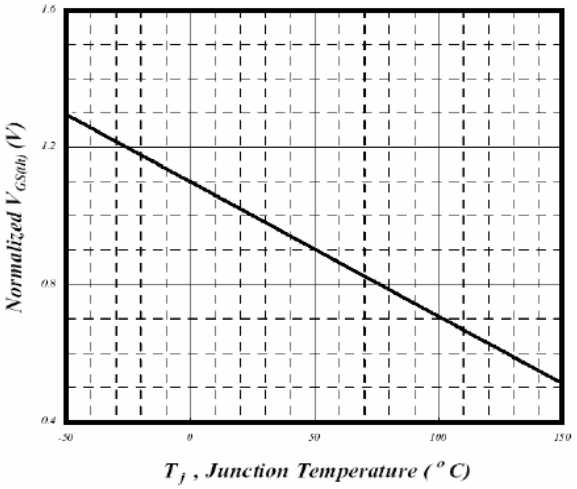


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

P-channel Characteristic Curves(Cont.)

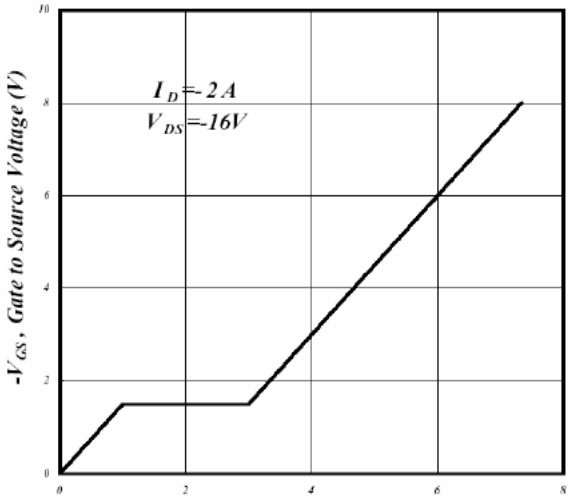


Fig 7. Gate Charge Characteristics

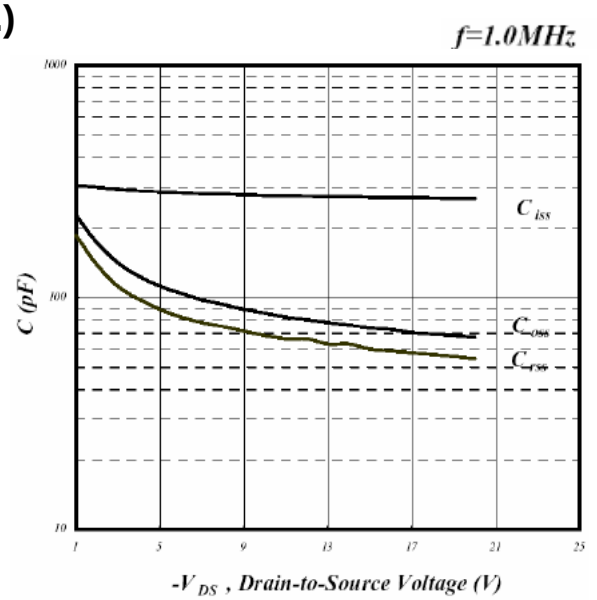


Fig 8. Typical Capacitance Characteristics

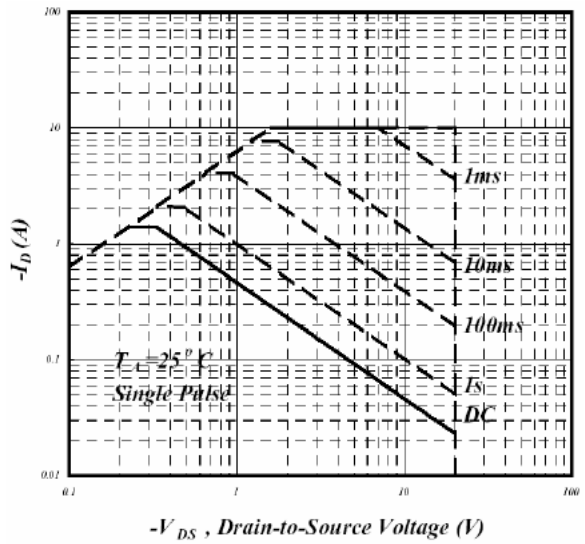


Fig 9. Maximum Safe Operating Area

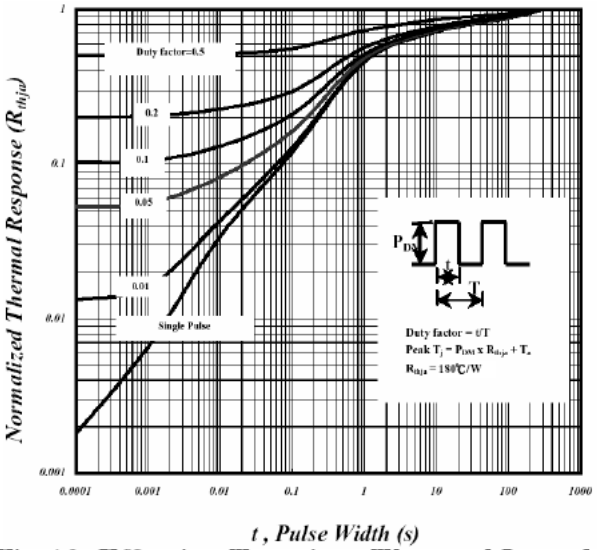


Fig 10. Effective Transient Thermal Impedance

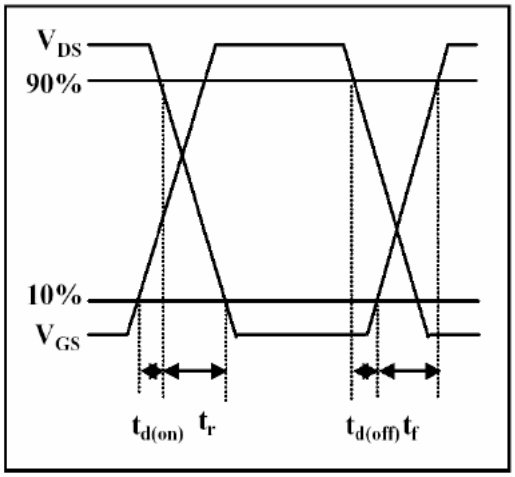


Fig 11. Switching Time Waveform

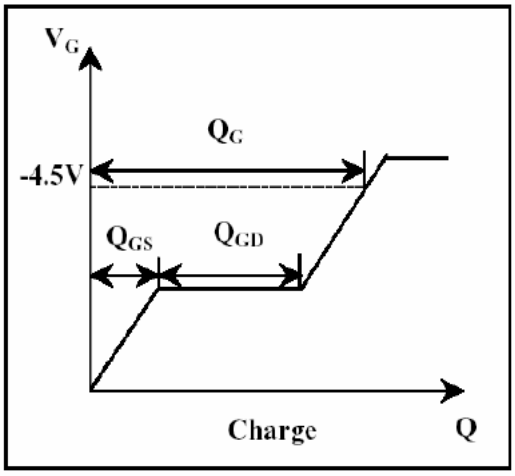
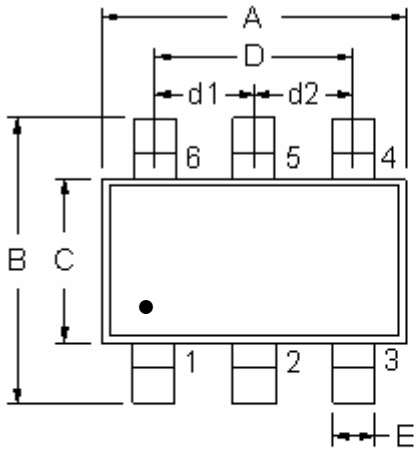
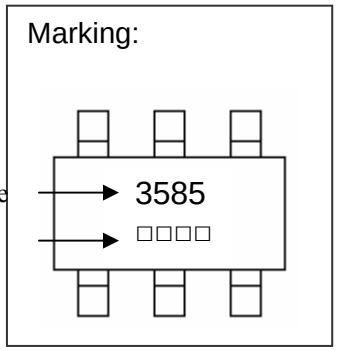


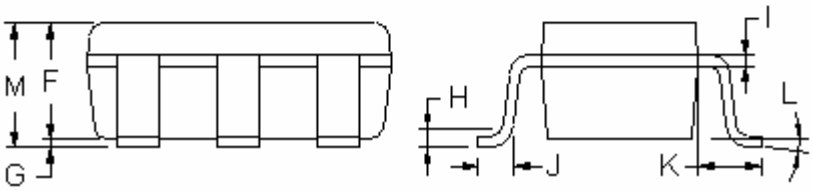
Fig 12. Gate Charge Waveform

TSOP-6 Dimension



Style:
Pin 1. Gate1 (G1)
Pin 2. Source2 (S2)
Pin 3. Gate2 (G2)
Pin 4. Drain2 (D2)
Pin 5. Source1 (S1)
Pin 6. Drain1 (D1)





6-Lead TSOP-6 Plastic
Surface Mounted Package
CYStek Package Code: G6

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1063	0.1220	2.70	3.10	G	0	0.0039	0	0.10
B	0.1024	0.1181	2.60	3.00	H	-	0.0098	-	0.25
C	0.0551	0.0709	1.40	1.80	I	0.0047 REF		0.12 REF	
D	0.0748 REF		1.90 REF		J	0.0177 REF		0.45 REF	
d1	0.0374 REF		0.95 REF		K	0.0236 REF		0.60 REF	
d2	0.0374 REF		0.95 REF		L	0°	10°	0°	10°
E	0.0118	0.0197	0.30	0.50	M	-	0.0433	-	1.10
F	0.0276	0.0394	0.70	1.00					

Notes : 1.Controlling dimension : millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material :

- Lead : 42 Alloy ; pure tin plated
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0